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Reports which have been read, and also upon having heard from Lord Bury such an able exposition of the physical capabilities of this great country. I have also great pleasure in announcing that, in reply to an application which I made to obtain permission for Captain Palliser and his associates to return to England by crossing the Rocky Mountains into British Columbia, Sir E. B. Lytton has acceded to that request, which had indeed been preferred by the travellers themselves; and thus many most important and interesting additions will doubtlessly be made to those discoveries the nature of which we have been considering this evening.

Seventh Meeting, February 28th, 1859.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*Lieut.-General P. Cannon; Viscount Strangford; James Brand, Pascoe St. Leger Grenfell, T. Corbyn Janson, and Thomas Sopwith, C.E., Esqrs., were presented upon their election.*

ELECTIONS.—*Major A. C. Cooke, R.E.; Lord De Blaquiere; Commander W. N. W. Hewett, R.N.; Rev. Evan Lewis, B.A.; Captain Kenneth Murchison; Captain Robert Havard Price; Lieut.-Colonel J. F. D. Crichton Stuart, M.P.; Rev. F. W. Tremlett, M.A.; and Henry Hulse Berens; William Ewart, M.P.; Henry Hansard; William Mitchell; Thomas Phinn, Q.C.; Edward Rawdon Power, and Henry William Willoughby, Esqrs., were elected Fellows.*

AUDITORS.—Thomas H. Brooking and E. Osborne Smith, Esqrs., on the part of the Council, and Thomas Lee, Esq., and the Rev. J. Worthington, D.D., on the part of the Society, were appointed Auditors.

EXHIBITIONS.—Two large paintings by Mr. Atkinson, showing the character of mountain scenery at the source of the Bascan, and the snowy chain of the Ac-tu, were exhibited.

The Papers read were :—

1. *A Journey through some of the Highest Passes in the Ala-tu and Ac-tu Mountains in Chinese Tartary.* By T. W. ATKINSON, Esq., F.R.G.S. and G.S.

DURING my wanderings in Central Asia I came upon several large river-beds, in some of which there was no water, in others the streams were so small that it was difficult to account for the formation of such enormous water-courses. I shall therefore attempt to describe a phenomenon caused by a terrible earthquake at some distant period, which rent the mountains asunder, letting out the water of a large Alpine lake, which has formed one of those vast channels across the plain. I also hope that my description will

convey some idea of the physical geography of this extraordinary region.

As it was necessary to await the arrival of the tribes, I determined to extend my ramble to a pass about twelve hours' ride to the eastward. For the first mile the steppe was covered with good grass, after this we came upon a tract of sand and pebbles, with occasional tufts of steppe grass, extending over about three miles; this led to a sandy plain entirely deprived of vegetation. Far to the north we could see some green patches of verdure surrounding a lake; but with this exception, the entire country appeared an arid desert. In about an hour and a half we reached the brink of one of the dry river-beds frequently found in these regions. This was a large one, not less than a mile and a half in width, and 130 feet deep, and the banks being nearly perpendicular, it formed a complete barrier to our progress in this direction. I sent two men along the bank, and took my only other companion upwards, searching for a place by which we could descend. After a long and fruitless ride, the report of a gun and the waving of a handkerchief by the two men brought me to a spot where they had discovered a track made by deer and other animals descending for water.

We rode over the brink and began to descend slowly, crossing a broken part of the path with great difficulty; at length the first man and myself reached the bottom. As we stood watching the other two the sand suddenly gave way under the feet of the last horse, and both man and animal rolled down apart from each other from a height of about 40 feet. We thought both killed, but on hastening to their aid, they rose to their feet; the horse gave himself a shake, and began to kick and plunge furiously, and the man burst into a fit of laughter.

All hope of returning by this track was now at an end, and we rode on making vain guesses as to what had become of the stream which had scooped out this formidable hollow. Sand and pebbles covered the greater part of the surface, interspersed with patches of fine grass; but near the middle we found several pools of fresh water, with a small stream uniting them. They were surrounded by beds of fine sand on which were the foot-prints of several animals of the deer tribe. Near one pool other foot-marks attracted the attention of my men, one of whom called out that the barse (tiger) had been there. On reaching the spot I saw distinctly the prints of huge feline paws, though not recent: most probably this tiger had followed the other animals into the mountains, whither they had gone in search of food.

A little farther we found a broad bed covered with large stones and coarse gravel, over which a stream of water was running rapidly, making it very difficult to ford; and the opposite bank proved as high and abrupt as the one we had descended. It was now past midday, and the pass in the mountains appeared still far distant. Questioning the Kirghis guide, I ascertained that he had never crossed this country before, and could tell me nothing reliable about the pass. Quickening our pace over the sandy steppe, at five o'clock we turned into the great ravine we had been seeking. The first few hundred yards was between grassy slopes with a little rivulet in the centre; having passed some rocky masses, the rugged mountain jaws opened upon us in all their grandeur. This was a terrific rent; the dark purple slaty rocks had been riven asunder by the granite, and heaved up into craggy precipices of enormous height. In some parts the rocks were broken into sharp points, in others they were piled up like huge towers overhanging the base of these mighty cliffs. To add to the wildness of the view, three large eagles were soaring far above our heads, and several were perched upon the crags.

The Kirghis imagined from this that some of his countrymen were encamped in the pass, and, riding forward, found unmistakable evidence that horses and other animals had recently passed on the other side of the stream. Presently we came upon three Kirghis, who, after a ride of little more than an hour, brought us to a wide part of the pass, where they had pitched their yourts on some grassy slopes, at a point where the gorge branched off in two directions. The tribe was taking advantage of the rich grass for a day or two before proceeding to the pastures in the Ala-tu.

All the camels, horses, oxen, and sheep had been assembled close about the yourts, as the space on which these had been pitched was so limited by the precipices around. Various were the sounds that greeted my ears on waking the next morning: the sharp cry of the camels and the bellowing of the bulls echoing among the rocks increased the confusion. As day dawned I turned out and stood at the door of the yourt, gazing in silent wonder at the scene before me.

The spot on which I stood was a green grassy mound in the middle of the gorge, and three yourts were placed upon it. A little below, on the bank of a small torrent, there were seven other yourts; while immediately opposite, and at about 300 yards from me, rose up a mighty mass of dark basaltic rocks to a much greater height than the distance from me to them. They were pillared and split into most curious forms—some of them like watch-towers

guarding the pass. These rocks divided the gorge, which branched off to the south and east: looking up the southern branch, the eye rested on the snowy crests near the source of the Ac-tu, and up the other were seen the dazzling peaks in which the Bascan has its source, while near me shrubs and flowers were hanging from the clefts, showing that spring was adorning these rugged forms with all her beauty. The whole space around the base of these rocks was filled with living animals, prominent among which I discovered the curved neck and shaggy head of the camel above the horses and oxen, while the goats and sheep were climbing almost inaccessible rocks in search of food.

Two of the sons of my hostess offered to provide horses, and accompany me part of the way, hoping to see our rifles used. I found great difficulty in obtaining a guide; the dangers that lay in the route I purposed taking were so great that the only man who knew the country refused to go with me; but on showing as a reward a flask of gunpowder and a few balls, his eyes sparkled with delight, and his objections vanished. All arrangements for our ascent having been completed, and a party sent back with our horses to the great water-course, we left the Aoul, and turning towards the southern branch of the pass, we rode up to the base of the basaltic cliffs, whence the view down the gorge was savagely grand.

While looking on this scene I could not avoid contrasting the puny efforts of man with these stupendous works of nature. How marvellously small the pyramids and temples of the Egyptians, and the great works of the Romans, would appear if placed at the foot of these towers of basalt; or near the shelving masses of trap, forming mighty stairs leading into the great recesses of the mountains, which in some parts are riven asunder, and horrible chasms seem to penetrate far towards their centre!

Our little band consisted of the two young chiefs, the old guide, three Kirghis, myself, and my two men.

After riding two hours, sometimes between high precipices, at others rocky slopes, we arrived at a part of the pass so abrupt that we could not ascend on horseback. Even on foot, we found it no easy matter to scramble up. At last we reached a small level space, about twenty yards in length and four in width, when a scene lay before us that few could look down upon without a shudder. We were standing on the brink of a precipice, and looking into a fearful chasm, into which no man could descend. The rocks were of dark purple slate, with a few shrubs hanging from the clefts; yellow and green moss covered the upper ledges, and at the bottom was a small

lake, the water appearing of inky blackness. To the north, crags rose up far above us, while to the south the mountain was so steep that it appeared impossible to find a path in that direction. This, however, was our only chance.

We began our ascent by going in slanting lines, gaining but little at each tack, and turning our horses with great difficulty. As we ascended higher, each turning gave us a deeper view into the terrible abyss, with nothing to stop man or horse should either slip. After extraordinary toil and no little anxiety we reached a part more easy to ascend, over which we rode. In due time we reached the crest of the mountain, when we turned towards the west, and saw that the day was fast declining. The old guide rode by my side, pointing out the peaks and crags near which we were to pass.

I inquired how he became so well acquainted with this wild region, and after a few questions to ascertain whence I came, and finding he had nothing to fear from me, he acknowledged that he once belonged to a strong band of robbers, commanded by a celebrated chief, "Kinsara." This man was the scourge of all the tribes, whom he often plundered, carrying off their horses, camels, men, women and children. His daring acts filled the Kirghis with so much dread that they dared not follow him into the mountains amidst scenes where they believed was the veritable residence of Shaitan.

Our route was along a mountain ridge, sometimes at the base of high igneous crags, at others over parts covered with moss and short grass. Then we came into a labyrinth of rocks, through which it appeared impossible to find our way; but our robber-guide led on without once being at fault. We presently obtained a splendid view of the snowy chain of the Ac-tu stretching to the east and west. Its vast glaciers and high peaks were sparkling like rubies in the setting sun; while beneath, several bold rocky ridges rose out of the haze, and nearer to us a lower chain of mountains and valleys covered with vegetation. This is the region in which the Kirghis find their summer pastures.

A short ride brought us to the bank of a small and rapid stream, which we followed down into the valley, where we found a fine clump of birch and *picta* trees, under which we took up our lodgings. It was indeed a quiet spot, for not a sound could be heard save the murmuring of the stream and our own voices. Near to our encampment another narrow valley branched off to the southward, running up between high mountains and rugged precipices. At the end of the ravine some high cliffs rose up, and far beyond it one of the highest peaks of the Ac-tu reared his mighty head, on which the last rays

of the sun were shining, lighting it up like a crimson beacon, while a gloomy twilight was creeping over us.

The effect was singularly beautiful. Around us luxuriant summer vegetation was growing, intermingled with flowers, blooming in all their glory. As the valley ascended, both flowers and vegetation gradually diminished through every grade, till the moss on the rocks disappeared. Then came a scene of utter desolation, where the effects of the thundering avalanches are palpably visible, the wreck of which cut off the view of the glaciers; while the high peak, clothed in his cold wintry garb, looked inexpressibly ghastly and chilling. Wishing to get a peep at my companions, I walked to a short distance, and beheld the group sitting around our camp fire. As the valley was shrouded in deep gloom, the bright-red flame gave a peculiar character to the scene. Having jotted down a few notes, I joined my companions, when our saddle-cloths were spread on the ground, and very soon all except the sentinel were fast asleep.

Just as day dawned I was awake by the neighing of one of the horses close to my ear. On looking round I observed the sun's rays had not yet touched the snowy peaks, and all the chain below was enveloped in a grey misty haze. Presently the people were roused and each man attending to his duties; the young chiefs spread their kalats on the grass and offered up their devotions; their example was followed by the other Kirghis and my men, each in his own peculiar way. In a short time we were in our saddles and riding up the valley, which was covered with rich grass and flowers, while shrubs and dwarf-cedars were growing and hanging from the clefts. In parts the precipices rose from 800 to 1000 feet, their summits split into various-shaped turrets and pinnacles. At one point huge buttresses jutted out into the valley, appearing as we approached to close up the ravine and stop all further progress; having passed these, we had a beautiful view of the snowy chain.

Near the source of the Bascan there was one very high peak, which had evidently been conical in form, and this had been torn asunder. One half only was standing; the rent was curved, and the upper part overhanging considerably. No snow could rest on this precipitous face, and the rocks appeared of a dark purple. The snow that had been accumulating on this mountain, probably for thousands of ages, was riven into perpendicular cliffs 700 or 800 feet high, appearing like Pentelic marble. This was a stupendous precipice, but the whole height could not be seen from our position; my impression, however, is, that it cannot be less than 2000 feet.

Having reached a point where the guide changed our route, we turned towards the west, up a narrow and abrupt ravine, by which we

were to ascend to the top of the cliffs. Here we had to dismount and lead our horses over places even difficult to pass on foot, and in about an hour we stood on the mountain slope, about 500 yards from the brink of the precipices. We had now ascended to about 1000 feet above the valley, and this small difference in elevation had effected a wonderful change. Instead of fine grass and luxuriant herbage, short mossy turf and stunted plants covered the surface. Among them I found the rhododendron chrysanthemum creeping among the rocks, with its dark shining green leaves and large bunches of beautiful yellow flowers. Even in sheltered situations, this plant never exceeds three feet in height. I have often found it spreading over a large space, and covering the rocks with its ever-green foliage. A dwarf-cedar was also trailing its branches among the masses of granite, extending to the length of fifty paces. The stems and branches were twisted about the rocks, like huge serpents coiling round them.

Our guide now led the way towards the crest of the ridge. After riding more than an hour we left vegetation behind us, and began to pick our slow and toilsome way over a rough and stony region. At length we reached enormous masses of green slate, shooting up into high pinnacles, so smooth and perpendicular that they can never be ascended. Passing round to the southward of these, we came upon a scene of terrible disruption and desolation, where rocks had been uprooted and hurled down into one chaotic mass of a most fearful effect, extending to the brink of a vast rent that had cut the mountain asunder. A terrible convulsion must have taken place here, rending the mountains in twain and forming chasms into which the boldest man cannot look without feelings of dread.

Having spent a short time contemplating this wonderful scene, we left the spot and rode along the edge of the fallen rocks for about two miles. At length we arrived on the brink of the ravine where it descended in a series of deep precipices; beyond this point our horses could not go, and here we had to part with our friends. Before separating we sat down at a little spring and eat our simple dinner—a few small pieces of hard Kirghis cheese washed down by water from the rill. Game is not abundant in this region; during the whole of our ride we had only seen two small herds of argali, and in both instances they were far out of the range of our rifles.

Our guide did not permit us to sit long—he urged our speedy departure, knowing the difficulties we had to encounter. The way was downward in an oblique direction for about 200 paces, after which we turned the steep rocks, clinging as well as we could to the projecting points. Having gained a narrow ledge, extending

along the top of a high precipice, the Kirghis led the way till we came to a break in the rocks. Here a part of the precipice had fallen, forming a stony slope both steep and dangerous, with another precipice at its base, where huge masses were over-hanging which appeared ready to topple into the gulf at the slightest touch. We stood for a few minutes looking at this rugged spot with dread, fearing, if we attempted to descend, the stones would give way and carry us into the depths below. As there was no other path, the Kirghis stepped on to the stony track, when all followed. After several slips and some bruises we reached the terrace, which I found ten to fifteen paces wide, and covered with bushes and plants. From this point I could discern the fearful depth beneath us.

We proceeded along the terrace, which descended to the west, narrowing to a mere ledge, forming a most rugged staircase not more than three feet wide, and in some parts even less. This had a very ugly appearance, but by the aid of the bushes we let ourselves down over many fearful places, and reached a steep part covered with fallen rocks, where poplar and birch trees were growing, with numerous shrubs concealing the cavities, and rendering our progress both slow and dangerous. We next came upon another narrow terrace covered with luxuriant vegetation, in some parts reaching above our heads. From the edge of this nearly level space a slope descended to a great depth, so abruptly that it was impossible to find a footing there.

The guide led us along through beds of plants, in which we lost sight of each other. We had not, however, gone far when we discovered a well trodden track made by a large animal, that the Kirghis at once pronounced to be a tiger. Creeping cautiously along, we reached the lair of the beast, where we found evidence that a tiger had recently been, the place being still warm. We followed the animal's track along the terrace about 200 yards, and then found he had turned down into the gorge among rocks and thick bushes, through which we could not penetrate. Leaving his path, we pushed on through the thick vegetation, and came to a point beyond which it seemed almost impossible to proceed. The place was formed by granite rocks nearly perpendicular, with a few bushes growing in the clefts, the mass presenting jutting points, our only aids in overcoming the difficulties of our descent. At length we arrived in safety on another grassy slope, which led us to the brink of the last precipice.

Having reached this place, we stood looking at the wild scene before us. The opposite side of the gorge was equally rugged and abrupt with that we had descended. We beheld stupendous precipices with

large trees growing at their base; shrubs and creeping plants were hanging from the fissures, which gave a softer, but a more sublime character to the scene than when viewed from above. At one part a line of stony turrets were standing on this vast wall, receding into hazy distance; in another, a huge mass 700 or 800 feet high was quite isolated from the precipice by a great chasm, having around its base huge trees covered with green and yellow foliage, contrasting beautifully with the red and purple rocks. Beneath these was a slope composed of débris fallen from the cliffs above, now covered with moss of almost every hue, and extending to the bottom of the pass. The ground appeared covered with grass, but the great depth made it look intensely gloomy. Looking up the gorge towards the south, I saw several of the snowy peaks of the Ac-tu gleaming in the sun, while all around us was in deep shade.

Having transferred this scene to my sketch-book, we continued our march downward, scrambling over many difficult spots, and reached the bottom to our great delight. Close to the foot of the rocks we found the bed of a torrent, in which a small stream was leaping and bubbling over the large stones heaped up in its channel. Following the stream down this tremendous defile for about half a mile, we saw a track by which the wild animals come down to drink. Proceeding onward, we presently came to a part where the water disappeared among the rocks. The defile here became narrower, while down one of its sides a small waterfall was pouring; its upper part was invisible, but the last leap was from a cliff between 500 and 600 feet high. Soon after bounding over the edge of the rock, the stream was wafted about by the breeze, like fine gauze floating in the air. As it descended lower, the water was dispersed in white spray, which fell upon us as we passed like a Scotch mist, and quickly producing a similar effect.

The gorge became narrower, till we could not see a hundred paces before us. At length it became a mere fissure, in some parts only twenty-two paces wide, in others twenty-five—with precipices varying from 1000 to 1200 feet in height. On one side the rocks were overhanging, on the other receding, having all the appearance of being able to fit into each other, could any power be found to press them together. The bottom was strewn with huge blocks of granite, slate, and jasper, which had been rolled on and rounded by the torrent. Sometimes the water rushes down this place, filling it to the height of thirty-five feet, as clearly shown by the lines on the face of the rocks. At these times no pencil could delineate the impetuosity of the water, or pen describe the thundering of the flood, as it rushes through this fearful chasm.

After proceeding about half a mile, which occupied us an hour, climbing over stones strewn in our path, we emerged from the terrible cleft into an enormous oval-shaped valley, scrambling up the side of a channel cut by the torrent to the depth of sixty feet. On reaching the top of the bank, I found we were on pastures, covered with rich grass and flowers. As our guide recognised the spot, his eyes sparkled with delight,—we were on one of the encamping grounds of Kinsara, and no doubt it recalled to the old man's mind many scenes of festal enjoyment after successful barrantas. He pointed to a place under some precipices on the north-west side as the locality of the Sultan's yours; farther to the west he indicated the position of the Aoul of his band, and directed our attention right across the valley to a point near the bank of a torrent, as the spot where a party had always been stationed to guard the pass.

We were now in a deep valley about four miles wide and fifteen long, surrounded by mountains varying from five to seven thousand feet in height, from which there appeared to be no outlet. The sun was shining brightly, and we found it intensely hot; still the grass was green, and the flowers blooming beautifully, proving that they received plenty of moisture. So great was the change on leaving the deep and gloomy gorge, and entering into this sunny spot, that it entirely removed a sense of oppression created by the rugged scenes I had passed. Standing for a short time on one of the heaps of stones, which the torrent had piled up, I examined the view around, and clearly perceived that this had once been a mountain lake of vast depth.

Going towards the base of the cliffs on the eastward, I passed several scattered heaps of large rounded blocks of granite, with patches of sand around them, in which I found many broken shells. Had I possessed the necessary implements for excavation, I should no doubt have found perfect ones. On reaching the cliffs I saw large masses of light green slate, washed down from the strata above, which had been thrown up at this point nearly perpendicular. The line was also distinctly visible where the action of the water had smoothed the rocks. Having with much difficulty climbed the precipice about 560 feet, I found great cavities formed by the water, and the slate broken away and rounded. Above this line there were no cavities, and all the rocks were angular and sharp. Thus a line was distinctly marked along the face of the cliffs indicating the water level.

Having descended, I ordered our march to be resumed, when we proceeded over a thick grassy turf, with occasional large patches of sand and pebbles, among which I found several beautiful agates.

Here I again discovered numerous shells, and after digging up a few inches of sand with my dagger found a bed of several kinds. Having gone about three miles, we came upon another deep channel coming from the south-west, in which a rapid stream was running over a rocky bed. The guide led the way up the bank to a point where we could ford without difficulty. Here the stream was about twenty yards wide, and deeper than agreeable, for in one part it was up to our middle and exceedingly cold, proving that it had come from a snowy source at no great distance. Our guide informed me that this river ran into a cavern in the mountain, and that no one dare approach, as Shaitan had his dwelling there.

Just at dark we reached our resting place, where we found a comfortable berth under some overhanging masses of granite, which had been scooped out by water, and here we lost no time in taking our glass of tea with a few scraps of soaked hyran. When darkness spread his mantle over the valley, shutting out of view the mountains to the south, we had nothing to look upon except the riven and serrated cliffs rising above us. These were partly lit up by the flickering light of our fire, giving a spectral appearance to their singular forms. This was the place on which Kinsara had lived, and my guide told me that no one of the band ever dared to disobey his orders, as doing so was certain death. He had acquired unbounded power over the mind of his followers by his bravery. If a desperate attack had to be made against fearful odds, he led the band, and was ever first in the fight, shouting his cry with uplifted battle-axe, and plunging his fiery steed into the thickest of the battle. This gave confidence to his men and was the secret of his success, but the Kirghis thought he was in league with Shaitan, and that no steel could touch him.

At the foot of these rocks many a man had rested before being sold into slavery, often seeing his wives and children divided among his captors. As we sat around our little fire watching the red glare upon the rocks, we were suddenly startled by a vivid flash of lightning which for a moment illumined the whole valley and adjacent mountains with a pale blue light. We were almost blinded, and the next instant left in thick darkness. A heavy roll of thunder now echoed among the mountains on the opposite side of the ridge under which we were encamped, several other flashes followed, all equally grand, but the storm passed along the chain and did not reach us.

The night passed over and the day dawned without our being disturbed, and long before the sun cast his rays into the valley we were up. While tea was preparing I rambled along the base of the cliffs, and found additional indications of this basin having once been

a lake. About half a mile to the west of our encampment there were heaps of rounded granite blocks strewn over a sandy shore; also several isolated masses varying from 100 to 300 feet in height, and standing about 60 yards from the cliffs. The sharp angles had all been worn off by water, and the precipices at this part were much undermined, in some places forming recesses 40 and 60 feet deep.

At one place I found a great triangular shaped mass, 130 yards on its sides, and about 450 feet high. This was pierced through by natural arches formed on each face 32 yards wide and of greater height, leaving the upper part standing on three great abutments. The scene was strikingly grand, and while sketching this beautiful object the sun rose, when I beheld part of his crimson orb through one of the natural arches, giving quite a magical effect to the landscape.

We continued our march to the eastward along the base of the cliffs, in some places over patches of sand and broken shells, till we reached a deep circular indentation extending into the mountain about a mile. The bottom was strewn over with blocks of granite, and the precipices rose to an enormous height; some to more than 1000 feet. Crossing this bay we reached the opposite headland, and then beheld the rent in the mountain through which we expected to make our exit and join our friends on the steppe.

After a walk of nearly two hours we came to the bank of the torrent which we forded yesterday, and not far from its entrance into the great ravine. The guide informed me that there were two tracks by which we could cross to the steppe. One was much shorter and down the gorge, but this was most difficult and dangerous; the other was a little way to the east and over the mountains: by this route Kinsara's band always rode their horses. I at once decided to follow the ravine, as it would take me to the cavern so much dreaded by the Kirghis, and into which the torrent plunged. We shortly entered the chasm, which I found was about 120 yards wide, covered with fallen rocks, among which the torrent went leaping and foaming with great fury. Our way was a rough and dangerous one over the fallen rocks, sometimes 200 and 300 feet above the stream, and then descending nearly to the level of the water. At last we reached a spot beyond which to all appearance we could not proceed. We were now a little above the torrent, which was hidden from our view, and close in front of us the rocks rose up like a wall to an enormous height, with their tops riven into pinnacles, some of them leaning so far over the brink as to excite our wonder at their stability. A loud roaring of the water was heard, which induced me to suppose it was rolling over a deep fall.

I was now led on over huge blocks straight towards the base of the cliffs, where I came to some vast masses over which it was impossible to climb. After scrambling round the end of these we entered a cleft formed in the fallen mass, which was almost dark. The old man, however, groped his way on, I followed close at his heels, and our companions were immediately behind me. Having threaded our way through this fissure for about 50 yards, we emerged into daylight, upon a narrow ledge overhanging the torrent. In front a dark jutting precipice almost closed the chasm, rising nearly perpendicular, not less than 1800 feet. A few small bushes were growing in the crevices near the pass, with scattered plants on the upper ledges, and in this Cyclopean mass was the yawning mouth of the cavern swallowing up the river. We stood silent with astonishment watching the torrent rush on into the fearful abyss, producing a sound that created such a feeling of dread, I ceased to wonder that the Kirghis thought Shaitan had his dwelling here.

The mouth of the cavern was formed by a rugged arch about 50 feet wide and 70 feet high: the river entered this opening in a channel cut into the solid rock—it was about 30 feet wide and apparently 10 feet deep. A ledge of rocks about 12 feet wide formed a terrace along the edge of the stream and just above the level of the water. When my astonishment had somewhat subsided, I prepared to explore the cavern by placing my packet of baggage and my rifle on the rocks, and the two Cossacks followed my example. The guide watched these proceedings with great interest, but when he beheld us enter the cavern he was horrified. Having proceeded about twenty paces the noise caused by the falling water was fearful, and a damp, cold, chilling blast met us. From this point the cavern extended both in width and height, but I could form no idea of its dimensions. We cautiously groped our way on in the gloom for about 80 yards from the entrance, when we could see the river bound into a terrific abyss “black as Erebus,” while some white vapour came wreathing up, giving the spot a most supernatural appearance.

Few persons could stand on the brink of this gulf without a shudder: the roaring of the water was dreadful as it echoed in the lofty dome. It was impossible to hear a word spoken, nor could this scene be contemplated long: there was something too fearful for the strongest nerves when trying to peer into these horrible depths. We turned away and looked towards the opening through which we had entered: for a short distance the sides and arch were lighted up, but the great space and vast dome were lost in darkness.

On leaving the cavern we passed round the jutting rocks and

entered the narrow chasm beyond. Its bed was covered with large and small rounded stones, proving that water had once flowed through this part of the gorge, and I have no doubt it does still during the great storms in the mountains. As we proceeded onward the ravine narrowed into a mere rent with over-hanging rocks, rendering the place dark and gloomy. Through this part our progress was slow and tedious, but in about an hour we came to a place where the gorge divided into two branches, one going towards the north and the other to the north-east. The guide said the latter, which was the widest, did not extend far into the mountains, but I found it a very picturesque ravine. Many flowering shrubs and bushes were growing from the crevices, and a small torrent was rushing down its centre. The high overhanging cliffs at this part of the gorge were dolomite.

We continued our march by the side of the torrent: sometimes it was bridged by huge masses which had been hurled from their beds above; in one place our passage seemed completely stopped, the whole gorge being filled with fallen rocks to the height of 200 feet, over which we found it no easy matter to climb. This mass of débris extended about 500 yards, and had recently fallen, apparent by the shrubs with their withered green leaves strewn over the rocks. We crossed this chaos with much difficulty and no very agreeable sensations, caused by several huge blocks which were hanging on the cliffs as if ready to fall with the slightest shake, and in about an hour arrived at another rent in the mountain. This chasm extended to the westward, down which came a rushing stream hissing and boiling on its course.

From the loud roaring in the great fissure I was certain there was a waterfall at no great distance. The guide could not be induced to enter this dark and gloomy cleft, so one Cossack remained with him, and the other accompanied me into the chasm. It was not more than 50 feet wide, with precipices rising 1000 to 1200 feet above us. Having proceeded about 100 yards, I came to a sudden turn in the cleft where the rocks overhung so much that the sky could not be seen. It was indeed a gloomy twilight and a dismal looking place, in which all objects were but dimly shadowed forth—even the sparkling water, which was dashed into spray as it broke over the rocks, had a most Tartarean appearance. It now required care in stepping over the green and slippery stones, which rendered our progress slow, but the roaring of the fall became louder every few minutes, adding much to the fearful effects of the place.

After groping our way on about 300 yards without getting a gleam of daylight, we entered a wider part of the chasm, and

beheld the sun shining on the crags. They were fringed with bushes and plants that were swinging about with the breeze more than 1200 feet over our heads. Looking up at these from the dark and dismal depth, their foliage appeared bathed in glorious light: this, and the glowing sky above, almost made me fancy that I was gazing from the shades of death into Elysium. From this point we hurried onward, and the noise of the waterfall became deafening. Presently we caught a glimpse of white vapour, and in a few minutes we stood before a sheet of falling water, which came bounding from a rocky ledge, 300 feet above us. It fell into a deep basin, out of which it came seething as from a caldron.

Looking upwards, the scene was sublime. Three successive falls were visible, leaping from rock to rock, and flinging their white spray into mid-air. The precipices have been worn by water into pillars and columns, round which the spray and vapour curled in wreaths as the wind wafted them upwards. In front of the middle fall there stood an enormous mass of dark rocks, quite isolated, and from sixty to seventy feet in height. The falling water strikes upon the head of this, and is thrown off in innumerable jets, forming a crystalline crown for the stony monarch of the chasm, while thin sheets of water descend over his sides, clothing him with a liquid garment, through which his gigantic form was indistinctly visible. From behind this mass a cloud of vapour rises which covers the rugged crags above as with a veil gently wafted by the breeze. Still higher there were other falls, but invisible to us, and unfortunately we could discover no part by which it was possible to climb these tremendous precipices.

Here was a fine study for a geologist, the rocks having been riven asunder, and their formation exposed to the depth of 1500 feet. In some places they are nearly perpendicular, in others overhanging masses appear ready to crush the intruder. After retracing my steps, the Kirghis led the way down the gorge.

Our march was now by the side of a roaring torrent, over which we were compelled to pass several times, which could only be accomplished with great difficulty. On one side of the ravine dark, frowning precipices rise up to a great height, from which prodigious buttresses jut out, crowned with huge pinnacles. Facing these are deep recesses in the cliffs, clearly indicating that these enormous masses have been torn asunder by some colossal power. After leaving the waterfall, a walk of an hour brought us to a wider part of the chasm, less abrupt on one side. Farther down I perceived the rocks rose from the edge of the torrent, without a ledge on which to set our feet. To proceed onward down the ravine was

impossible, and to climb the rocks before us appeared equally so ; but the old man led on to a mass of *débris*—up this we clambered to a ledge, by which we gradually ascended to the base of some perpendicular rocks rising to a great height. On reaching these, I found some were torn from the precipices, and standing quite isolated ; in other parts fissures were rent in their sides, and in one of these we began to scale the towering cliffs.

We had not ascended far when I had proof that the Kirghis was on the right track, for some pieces of wood had been driven into the beds of the rocks, by which to hold on in this perilous path. Our progress was slow and laborious ; as each new point was gained we scanned the crags above, to which it seemed almost impossible to climb. At length we reached a grassy ledge about 500 feet above the torrent, whence we could look down and see where the water filled the whole breadth of the gorge. After resting a short time we began toiling our way up in many a zigzag line, often swinging ourselves past jutting rocks by the aid of bushes which we found growing in the clefts. Having reached the base of some rocks, which formed a complete bar to our farther progress, our guide for a moment looked bewildered. He soon, however, discovered that we had taken a wrong track, and quickly descended about fifty feet, and found the right one. We joined him, and then proceeded onward to the foot of some lofty slate crags of a deep red colour, round which we had to creep along a narrow ledge with a perpendicular wall of rocks near 600 feet beneath us. Our little pack and rifles were taken from our shoulders and pushed on before us ; and after crawling in this way for about thirty yards, we turned round the rocks and reached a grassy terrace twenty feet wide, greatly comforted with the assurance that we had passed the worst part of the ascent.

Looking down into the dark and yawning chasm with the roaring torrent 1200 feet beneath tried the nerves severely. A little farther down I perceived the chasm became a mere fissure—in one place the upper rocks projecting so far, that a stone dropped from their edge would have struck the opposite precipice before reaching mid-way down. So little had the hand of time affected these masses, that each projection would have fitted into the opposite recess. After resting a short time to breathe, we began our last ascent with fresh vigour. As we turned away, the precipices seemed to unite, forming a most stupendous archway that would have been a fit entrance to the regions of darkness. The path even now was sufficiently abrupt : sometimes we had to climb the cliffs clinging to the bushes, by the aid of which we reached the small terraces that led us upwards.

At length, after much toil, we stood on the summit, having been two hours and forty minutes in making the ascent. What a savage and desolate scene was now before us! To the south, the crest of the mountain rose up riven into lofty crags—enormous rocks were lying at their base, tumbled about and forming a fearful ruin, extending from the brink of the gorge several miles to the westward. To the east were similar confused masses, and the ridge terminated in a lofty peak. The view to the northward was over the vast steppe, but no signs of men or animals were visible. It was a dreary solitude over which the last rays of the sun were fading away. From this point the chasm turned slightly toward the east for about 500 yards, and then it ran in a northerly direction till lost to my view. After carefully examining the precipices along the whole of our two days' march and during the last ascent, I became fully convinced that this gorge had been formed at once, by a great and terrible earthquake, which rent the mountain asunder, and let out the water of the lake, and this had formed the great water-course across the plain.

Proceeding in a north-westerly direction, and leaving the gorge considerably to our right, we soon gained a grassy turf, among which were growing numerous flowers, some of great beauty, particularly a deep crimson variety, which was trailing its delicate branches along the grass. In little more than an hour we attained a very abrupt part of the mountain, from which we looked down on the last low ridge. This appeared about three miles across, and at a short distance beyond we saw the fire of our companions blazing brightly. From this place the descent was steep, but we proceeded at a good speed, as night was rapidly advancing, and shortly afterwards I was sitting comfortably at our camp, not sorry at having safely concluded an adventurous day's journey of sixteen hours.

T. W. A.

THE PRESIDENT.—I am glad, gentlemen, that you have cordially returned thanks to Mr. Atkinson, of whom I may say that he is the only Englishman who has ever approached that great region, a portion of which he has described to-night; I may add, that no Russian, except a few Cossacks, certainly no naturalist and no competent geographer, has ever been over the larger part of these wild tracts of Mongolia and Central Asia. He might well say that geologists must wish to visit these scenes; and, certainly, after many parts of his description, I deeply regret that I am becoming too old to follow his footsteps.

The point to which he calls your attention towards the close of his paper is the remarkable outlet of a large body of water, due as he supposes to an earthquake which caused a rent in the mountains. At what period, he does not attempt to define; he leaves it to future geologists to examine into the nature of the rocks, and determine if they can the character of the rocks and glaciers at the upper end of this deep valley, and to say at what period this rent took place.

Apart from his ability as a water-colour artist Mr. Atkinson is an excellent word-painter; for he so delineates the physical features of a country, that you seem actually to travel through a region which very few of us can ever hope to visit.

The second Paper read was—

2. *Despatch from Captain HENRY STRACHEY, Gold Medallist R.G.S., respecting the fate of ADOLPHE SCHLAGINTWEIT.*

Communicated by the Right Hon. Lord STANLEY, M.P., F.R.G.S., Secretary of State for India.

ADOLPHE SCHLAGINTWEIT crossed the Para-Lassa Pass from India to Thibet on the 31st May, 1857. The last documentary evidence consists of his letter to Harkishu from Chang-Chenmo of Ladak, dated the 14th June, with a postscript, stating that it was not sent till the 24th of June, and one or two notes, for sundry payments, of the latter date. These documents were brought from Ladak by the Chuprassies who joined Harkishu at Khardong of Garzha on the 20th of July, from whose statements it appears that before they left the moonshee, Mohamed Hasan, had deserted, taking the ponies, some money, and other articles belonging to M. Schlagintweit, but was overtaken, and the property recovered. Harkishu gathered from Captain Montgomerie, F.R.G.S., of the Trigonometrical Survey, and his native doctor, that they were in Ladak during the summer when he had left. From the locality of his last despatch, Chang-Chenmo, it is inferred that he crossed the Turkish waterparting to the east of the Kara-Korum Pass, perhaps to Sugat on the head of the Kara-Kash, and thence followed the route taken by his brothers the previous year towards Kiliam and Khoten. It seems that he had laid in a stock of merchandise to facilitate his journey by trading. From another source, the Bholiyas of Jwar, the information serves to show that he had reached the margin of an inhabited country at the foot of the mountains; left his camp to reconnoitre, and, in his absence, the guide absconded with most of the baggage and cattle towards Yarkand. Being thus left helpless, M. Schlagintweit sent to the Yanadar of Le for assistance in men, cattle, provisions, &c., whether for the purpose of penetrating into Turkistan, or returning to Ladak, remains undetermined. The next accounts are derived from merchant travellers from Ladak, from whom it appears that he had passed the winter of 1857-58 on the border of Khoten, and that on his arrival the provinces of Kashgar and Yarkand were in a disturbed state from one of the periodical invasions of the Turks. It is unlikely that he would remain more than one winter here, or that if still in the locality he would not have opened communication